CEREBROVASCULAR LESIONS IN THE DEVELOPING BRAIN - WHAT IS THE CONTRIBUTION OF MRI?

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Cerebrovascular complications occur in 35-50% of preterm and in 17% of term infants. Prognosis is influenced by the maturation state of the brain at the time of the injury. Patterns of structural abnormalities allow a conclusion on the time of their origin. Purpose of our study was to find out to which extent characteristic patterns can be recognized with MRI in infants and children with known or clinically suspect cerebrovascular lesions.

We examined 17 infants and children, aged from 2 weeks to 4 years (mean age 5,3 months). MRI was done using a 1,5T superconducting system with T1 and T2 weighted spin echo sequences. 3-5mm thick slices were performed in at least 2 planes.

Residual states of germinal matrix hemorrhages were found in 6 cases, 3 cases presented with unilateral irregularily marginated ventricular enlargement, due to an incorporation of periventricular cavities, 8 showed periventricular leucomalacic areas. Probable reasons for cerebrovascular injuries were: preterm birth (8x) coagulation abnormalities (1x), perinatal asphyxia (2x) and unknown (4x). Myelination retardation was seen in 5 infants with ischemic lesions.

Our findings suggest that MRI may be a valuable tool to recognize different types of cerebrovascular lesions in the developing brain. On the one hand, reasons for unclear clinical symptoms are revealed, and, on the other hand, a prediction of probable outcome is possible to some extent.

CT- AND MR-FINDINGS IN SNEDDON´S SYNDROME

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Sneddon´s syndrome (SS) is a rare, but potentially fatal arterioocclusive disorder, characterized by generalized livedo racemosa and cerebrovascular lesions.
This study consists of 17 patients, documented by dermatologic and laboratory examinations, as well as neurologic and neuroradiologic investigations. Diagnosis was confirmed by histopathology of skin biopsies in all patients.
There was a wide variety of neurological symptoms, most of them correlating with transient ischemic attacks and completed strokes in the territory of the middle cerebral artery. Unspecific symptoms, like headache and dizziness were frequent and preceded focal neurological symptoms or generalized livedo racemosa for many years.
Neuroradiologically, cerebral involvement was studied by means of computerized tomography (CT) in 16 patients and magnetic resonance imaging (MRI) in all patients. Both methods were equal in detection of large and medium sized territorial infarctions. MRI, however, was superior to CT in demonstration of small multifocal lesions within the deep white matter. This pattern was detected in 14 patients and represented the most constant MR-finding. Additionally, ischemic infratentorial changes in 8 patients could only be demonstrated by MRI. We conclude that MRI seems to be a more sensitive method to confirm morphologic changes of the brain in SS and may represent a new diagnostic criterion.

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MRI in the differential diagnosis of Alzheimer`s disease and vascular dementia

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The MRI scans of 27 patients with probable Alzheimer`s disease (mean age 68.2 yrs), 31 patients with vascular dementia (mean age 69.9 yrs) and 18 normal controls (mean age 66.3 yrs) were compared to evaluate possible distinguishing parenchymal abnormalities among these groups. Atrophy was quantitated by subjective rating, linear and volumetric measurements.
A number of findings were significantly more common in vascular dementia than in the other subsets. These included (1) basal ganglionic/thalamic hyperintense foci (2) thromboembolic infarctions (3) confluent white matter and (4) irregular periventricular hyperintensities

Signal abnormalities on intermediate T2-weighted scans in the uncalhippocampal or insular cortex were frequently and almost exclusively noted in Alzheimer`s disease.
Moderate and severe cortical and ventricular atrophy and a third ventricular to intracranial width ratio larger than 7% were good discriminators between demented groups and normal aging. Selective atrophy measurements, however, failed to separate dementia syndromes.
These results suggest that MRI has the potential to increase the accuracy of the clinical diagnosis of Alzheimer`s disease and vascular dementia.

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SUPERFICIAL SIDEROSIS OF THE CENTRAL NERVOUS SYSTEM: REPORT OF THREE CASES AND REVIEW OF THE LITERATURE

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Three cases and a review of the literature are presented to demonstrate the current state of clinical diagnosis and therapy of superficial siderosis of the central nervous system. Our patients showed symptoms including progressive ataxia, mental deterioration, spasticity and hearing loss. Persistent xantochromia of the cerebrospinal fluid indicating chronic subarachnoid hemorrhage, and the presence of siderophages, bilirubin and iron-containing pigments are typical for superficial siderosis. Pathophysiologically, iron intoxication of the central nervous system is considered. Deposition of free iron and hemosiderin in pial and subpial structures was suggested by magnetic resonance imaging. The T2 weighted images showed hypointensity of the marginal zones of the central nervous system secondary to an iron-induced susceptibility effect. This hypointensity seems pathognomonic of superficial siderosis. In 38 of the 40 previously described cases superficial siderosis was verified by biopsy or autopsy. Today, magnetic resonance imaging enables diagnosis at an early stage of the disease.
With regard to therapy, identification and elimination of the source of bleeding is of prime importance. In one of our patients an ependymoma was detected, the other two cases had to be classified as idiopathic superficial siderosis for which no therapy is available yet.

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Abstracts | Published: December 1991

8th Annual meeting of the Austrian society of neuroimaging under the auspices of the research group on neuroimaging, WFN held in Innsbruck, Austria 27–28 September 1991

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Journal of Neurology **238**, 463–468(1991) | Cite this article